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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/634,280	08/05/2003	Neal B. Lesh	MERL-1481	7122

7590	08/11/2006

Patent Department
Mitsubishi Electric Research Laboratories, Inc.
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Cambridge, MA 02139

EXAMINER
LEWIS, ALICIA M

ART UNIT	PAPER NUMBER
2164	

DATE MAILED: 08/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *26 May 2006*.

2a) ☒ This action is **FINAL.**   2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-13* is/are pending in the application.

　　4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-13* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

　　Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

　　Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

　　a) ☐ All　b) ☐ Some * c) ☐ None of:

　　　　1. ☐ Certified copies of the priority documents have been received.

　　　　2. ☐ Certified copies of the priority documents have been received in Application No. _____.

　　　　3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

　　* See the attached detailed Office action for a list of the certified copies not received.

SAM RIMELL
PRIMARY EXAMINER

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
　　Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
　　Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This office action is responsive to communication filed May 26, 2006. Claims 1-3

and 6 have been amended, and claims 8-13 have been added. Therefore, claims 1-13

are pending in this application.

Claim Rejections - 35 USC § 101

1.　　35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of
> matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the
> conditions and requirements of this title.

Claims 1-13 are rejected under 35 U.S.C. 101 because the claimed invention is

directed to non-statutory subject matter. The language of the claims raises a question

as to whether the claim is directed merely to an abstract idea which would result in

practical application producing a concrete, useful, and tangible result to form the basis

of statutory subject matter under 35 U.S.C. 101. Regarding claims 1-7 and 9-13, the

method consists solely of mathematical operations without a tangible result. Claim 8 is

not limited to tangible embodiments. Applicant's disclosure does not specify upon what

the computer program product is stored. Therefore, the claim is not limited to statutory

subject matter and therefore is non-statutory.

Claim Rejections - 35 USC § 103

2.　　The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3.   Claims 1, 3, 6, 8, 9 and 12 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Applicants' Admitted Prior Art (AAPA) in view of Beygelzimer et al.

(US Patent Application Publication 2002/0161736 A1) ('Beygelzimer').

With respect to claims 1 and 8, AAPA teaches:

applying a priority algorithm in a form of an ordering function to an instance of the

combinatorial optimization problem to produce an ordering of the elements (elements

110 and 103 in Figure 1);

applying a placement function to map values to the corresponding elements of

the ordering (element 120 in Figure 1).

AAPA does not teach modifying the ordering of the elements to produce a re-

ordering of the elements; and repeating the modifying and the applying until all

elements have been placed to obtain a solution of the combinatorial optimization

problem.

Beygelzimer teaches systems and methods for using continuous optimization for

ordering categorical data sets (see abstract) in which he teaches:

modifying the ordering of the elements to produce a re-ordering of the elements

(paragraph 37 lines 9-18, paragraphs 64-65, paragraph 66 lines 5-7); and

repeating the modifying and the applying until all elements have been placed to obtain a solution of the combinatorial optimization problem (paragraph 34 lines 4-5, paragraph 66 lines 5-7).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified AAPA by the teaching of Beygelzimer because modifying the ordering of the elements to produce a re-ordering of the elements; and repeating the modifying and the applying until all elements have been placed to obtain a solution of the combinatorial optimization problem would enable the formulation of the ordering problem in a fundamentally different way, which would avoiding intractable combinatorial formulations (Beygelzimer, paragraph 29).

With respect to claim 3, AAPA as modified teaches in which the priority algorithm is dynamic (AAPA, paragraph 8 lines 6-7).

With respect to claims 6 and 12, AAPA as modified teaches in which the re-ordering uses a decision vector, and in which the decision vector has one field for each element of the order, each field determining a new order of the element in the re-ordering (Beygelzimer, paragraph 53).

With respect to claim 9, AAPA as modified teaches:

applying a priority algorithm in a form of an ordering function to an instance of the combinatorial optimization problem to produce an ordering of the elements, in which the

priority algorithm is dynamic (AAPA, elements 110 and 103 in Figure 1, paragraph 8

lines 6-7);

modifying the ordering of the elements to produce a re-ordering of the elements

(Beygelzimer, paragraph 37 lines 9-18, paragraphs 64-65, paragraph 66 lines 5-7);

applying a placement function to map values to the corresponding elements of

the re-ordering (AAPA, element 120 in Figure 1); and

repeating the modifying and the applying until all elements have been placed to

obtain a solution of the combinatorial optimization problem (Beygelzimer, paragraph 34

lines 4-5, paragraph 66 lines 5-7).

4.   Claims 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over

Applicants' Admitted Prior Art (AAPA) in view of Beygelzimer et al. (US Patent

Application Publication 2002/0161736 A1) ('Beygelzimer') as applied to claims 1, 3, 6, 8,

9 and 12 above, and further in view of Angelopoulos et al., "On the Power of Priority

Algorithms for Facility Location and Set Cover," APPROX, pp 26-39, 2002

('Angelopoulos').

With respect to claim 2, AAPA as modified teaches claim 1.

AAPA as modified does not teach in which the priority algorithm is fixed.

Angelopoulos teaches priority algorithms (see abstract) in which he teaches in

which the priority algorithm is fixed (page 27 lines 9-11).

It would have been obvious to a person having ordinary skill in the art to have

further modified AAPA by the teaching of Angelopoulos because a priority algorithm that

is fixed would enable a predetermined ordering of values, which would not change throughout execution of the algorithm (Angelopoulos, page 27 lines 9-11).

5.   Claims 4, 5, 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants' Admitted Prior Art (AAPA) in view of Beygelzimer et al. (US Patent Application Publication 2002/0161736 A1) ('Beygelzimer') as applied to claims 1, 3, 6, 8, 9 and 12 above, and further in view of Krishnan et al. (US Patent Application Publication 2003/0051165 A1) ('Krishnan').

With respect to claims 4 and 10, AAPA as modified teaches claims 1 and 9.

AAPA as modified does not teach in which the re-ordering is within a predetermined distance of the ordering.

Krishnan teaches adaptive re-ordering of data packet filter rules (see abstract), in which he teaches in which the re-ordering is within a predetermined distance of the ordering (paragraphs 33-34).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have further modified AAPA by the teaching of Krishnan because in which the re-ordering is within a predetermined distance of the ordering would enable a better-performing, rule-based operation (Krishnan, paragraph 8 lines 12-14).

With respect to claims 5 and 11, AAPA as further modified teaches in which the distance is a Kendall-tau distance (Krishnan, paragraph 34).

6.   Claims 7 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Applicants' Admitted Prior Art (AAPA) in view of Beygelzimer et al. (US Patent

Application Publication 2002/0161736 A1) ('Beygelzimer') as applied to claims 1, 3, 6, 8,

9 and 12 above, and further in view of Lesh et al. (US Patent Application Publication

2004/0167661 A1) ('Lesh').

>   With respect to claims 7 and 13, AAPA as modified teaches claims 1 and 9.

>   AAPA as modified does not teach in which the re-ordering is probabilistic.

>   Lesh teaches a method for packing rectangular strips (see abstract) in which he

teaches in which the re-ordering is probabilistic (paragraph 72).

>   It would have been obvious to a person having ordinary skill in the art at the time

the invention was made to have further modified AAPA by the teaching of Krishnan

because in which the re-ordering is probabilistic would enable the selection of decision

vectors at each step randomly according to a probability distribution (AAPA, paragraph

43).

Response to Arguments

7.   Applicant's arguments filed June 5, 2006 have been fully considered but they are

not persuasive.

8.   In response to applicant's argument that Beygelzimer is nonanalogous art, it has

been held that a prior art reference must either be in the field of applicant's endeavor or,

if not, then be reasonably pertinent to the particular problem with which the applicant

was concerned, in order to be relied upon as a basis for rejection of the claimed

invention. See In re Oetiker, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this

case, Beygelzimer is reasonably pertinent to the problem with which applicant is

concerned, solving combinatorial optimization problems. Beygelzimer teaches

formulating the ordering problem in a different way, as a combinatorial optimization

problem, which allows tractable combinatorial formulations (paragraphs 29 and 34).

9.   Applicant argues that Examiner's reasoning does not reveal the relationship

between the claimed elements and the graphs of Beygelzimer, examiner does not state

what a spectral algorithm has to do with the claimed optimization problem, and that

Beygelzimer's re-ordering operates in a continuous space. Beygelzimer's graphs are

used to solve combinatorial optimization problems, and thus are related to the claimed

elements. The spectral algorithm is similar to applicant's priority algorithm in that it is

used, in combination with AAPA, to solve the combinatorial optimization problem as

claimed in claim 1. Applicant's claims do not state the limitation that the re-ordering

must be done in a non-continuous space. Furthermore, paragraph 33 of Beygelzimer

discloses that his algorithm translates the discrete ordering problem to a continuous

problem, solves the continuous problem, and then maps the optimal solution to the

closest discrete solution.

10.   Applicant further argues that Beygelzimer does not describe the modifying of the

ordering of the same set of elements repeated to produce a re-ordering. Examiner

respectfully disagrees. Paragraphs 37, 64, 65 and 66 all describe modifying the

ordering of the same set of elements to produce a re-ordering of the elements.

11.   In response to applicant's argument that Krishnan is nonanalogous art, it has

been held that a prior art reference must either be in the field of applicant's endeavor or,

if not, then be reasonably pertinent to the particular problem with which the applicant

was concerned, in order to be relied upon as a basis for rejection of the claimed

invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this

case, Krishnan is in the field of applicant's endeavor, re-ordering algorithms. Although

Krishnan's re-ordering algorithm is used for a different purpose, it is still a re-ordering

algorithm and can be used to solve the problem of re-ordering elements.

12.   Applicant also argues that the re-ordering of Krishnan is a bubble-sort and does

not use distance metrics. However, paragraph 28 of applicant's specification discloses

that the Kendall-tau distance is equal to a 'bubble-sort' distance.

Conclusion

13.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alicia M. Lewis whose telephone number is 571-272-5599. The examiner can normally be reached on Monday - Friday, 9 - 6:30, alternate Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Rones can be reached on 571-272-4085. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SAM RIMELL
PRIMARY EXAMINER

Alicia Lewis
August 3, 2006